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EPIGONUS TREWAVASAE POLL, A JUNIOR SYNONYM OF *EPIGONUS CONSTANCIAE* (GIGLIOLI) (PERCIFORMES, APOGONIDAE)

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ABSTRACT The holotype of *Pomatomichthys constanciae* Giglioli was reexamined and compared with specimens of *Epigonus trewavasae* Poll from equatorial west Africa, northwest Africa, Madeira, and the western Mediterranean. The two nominal forms were not distinguishable at the species level; thus, the name *Epigonus constanciae* should be used for the species under consideration. A description and discussion of the geographic variability of *E. constanciae* is provided.

INTRODUCTION

Questions about the status of *Pomatomichthys constanciae* have recently arisen as the result of increased interest in deep-sea members of the family Apogonidae. *P. constanciae* was originally described from a single specimen from the Straits of Messina (Giglioli, 1880). The description was incomplete, unillustrated and included several inaccuracies. Although Giglioli designated the fish a new species, he indicated that the specimen resembled juveniles of the more common Mediterranean apogonid, *Epigonus telescopus* (Risso).

Perhaps because of Giglioli's comment and because of the dearth of information about Mediterranean continental slope ichthyofaunas, *P. constanciae* was generally accepted as a junior

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synonym of *E. telescopus* (e.g., Jordan and Evermann, 1896; Jordan, Evermann and Clark, 1930; Schultz, 1940; Tortonese and Queirolo, 1970; Tortonese, 1973). Goode and Bean (1896) were the last authors of a comprehensive treatise to give *P. constanciae* consideration as a separate species. Cavaliere (1956) claimed to have compared the juveniles of *Epigonus telescopus* and *Pomatomichthys constanciae*, but Tortonese and Queirolo (1970) and Tortonese (1973) deemed the study of doubtful validity.

In 1974, Mayer published a revision of the genus *Epigonus*. Although the paper included *P. constanciae* as a synonym of *E. telescopus*, it pointed out that several features of *P. constanciae* were reminiscent of traits characteristic of *Epigonus trewavasae* Poll. The same work reported *E. trewavasae* from the Mediterranean for the first time and urged that further studies be undertaken on the relationship between *E. trewavasae* and *P. constanciae*.

The current paper stems from a reexamination of the *P. constanciae* holotype and a comparison of this specimen with *E. trewavasae* from equatorial west Africa, Mauritania, Madeira and the western Mediterranean. Our findings indicate that *P. constanciae* and *E. trewavasae* are conspecific and that the correct name for the species should be *Epigonus constanciae* (Giglioli).

METHODS

Specimens were examined according to techniques outlined by Mayer (1974, 1975) and by Hubbs and Lagler (1958). Statistical analyses were performed on a Wang Model 720 Programmable Calculator at the Department of Marine Science, University of South Florida. A package program was used to calculate routine meristic parameters, such as means and standard deviations. Linear regression analyses were undertaken on mensural data using Ricker's method for Functional (GM) Regressions (1973: 412–414). To insure linearity, scatter diagrams were plotted for all morphometric data. Characters exhibiting non-linear scatters, as determined by inspection, were excluded from consideration.

Meristic characters exhibiting slight variability are reported in the text as the value of the character followed by the number of individuals exhibiting that character. Data exhibiting greater variability are presented in tabular form. Mensural data are

presented as linear regressions and/or as ratios on standard length (SL) or head length (HL).

Specimens for this study were obtained from the following institutions:

IRSN:	Institut Royal des Sciences Naturelles de Belgique, Brussels
ISH:	Institut für Seefischerei, Hamburg
ISTPM:	Institut Scientifique et Technique des Pêches Maritimes, La Rochelle
MCZ:	Museum of Comparative Zoology, Cambridge, Massachusetts
MF:	Museo Municipal do Funchal, Madeira
MSNG:	Museo Civico di Storia Naturale, Genoa
MZF:	Zoological Museum, Florence
USNM:	National Museum of Natural History, Washington, D.C.
ZMB:	Zoologisches Museum der Humboldt Universität, Berlin

SYSTEMATICS

Mayer (1974: 183–186) provided a comprehensive description of *Epigonus trewavasae.* The following discussion of *E. constanciae* represents a recapitulation of the former account, modified to reflect data obtained from a larger, more representative sample of individuals. Readers are referred to Mayer (1974) for synonymies, accounts of ontogenetic change and in-depth comparisons with congeners.

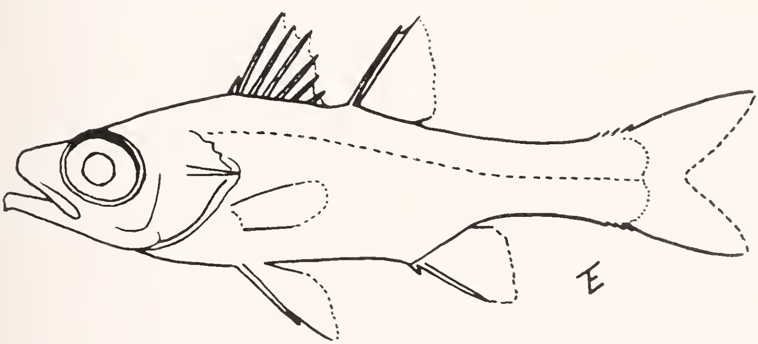


Figure 1. *Epigonus constanciae* holotype, MZF 3089, 115 mm SL.

Epigonus constanciae (Giglioli, 1880). Figure 1.

Pomatomichthys constanciae Giglioli, 1880: p. 20; original description; Straits of Messina. Holotype examined: MZF 3089.

Epigonus trewavasae Poll, 1954: p. 91; figure 27; original description; NOORENDE III, Sta. 52: 06°08′S, 11°30′E, 280–290 m. Holotype examined: IRSN 209.

Material Examined

IRSN 209 (1: 153.9 mm, holotype *Epigonus trewavasae*, NOORDENDE III Sta. 52, 06°08′S, 11°30′E, 280–290 m); IRSN 16549 (1: 97.1 mm, Golfe de Cagliari, 540 m); IRSN 16550 (4: 75.5–98.6 mm, Golfe d'Oristano, no depth recorded); ISH 386/64 (3: 144.6–153.2 mm, WALTHER HERWIG Sta. 137/64, 15°51′N, 16°51′W, 200 m); ISTPM uncatalogued (10: 129.9–158.9 mm, THALASSA Sta. U30, 17°56′N, 16°32′W, 224–322 m); ISTPM uncatalogued (1: 149.0 mm, THALASSA Sta. X007, 20°59′N, 17°37′W, 250–330 m); ISTPM uncatalogued (1: 148.0 mm, THALASSA Sta. X020, 19°08′N, 16°48′W, 280–468 m); MCZ 48849 (1: 76.9 mm, LA RAFALE Cr. 1, Sta. 27, 11°25′N, 17°21′W, 200 m); MF 3694 (1: 117.6 mm, from stomach of *Polymixia nobilis*); MF 7231 (1: no SL, from stomach of *Aphanopus carbo*); MF 8213 (1: no SL, from stomach of *P. nobilis*); MF 12518 (1: 124.5 mm, from stomach of *P. nobilis*); MF 14695 (1: 131.3 mm, from stomach of *A. carbo*); MF 15650 (1: no SL, from stomach of *A. carbo*); MF 16067 (2: 120–127 mm, from stomach of *A. carbo*); MF 17088 (1: 125.5 mm, from stomach of *A. carbo*); MF 18204 (1: 97.0 mm, from stomach of *A. carbo*); MF 20599 (1: no SL, from stomach of *A. carbo*); MSNG 38155 (1: 89 mm, Messina, Sicily); MZF 3089 (1: 117 mm, holotype of *Pomatomichthys constanciae*, Straits of Messina); USNM 207723 (2: 98.6–100.9 mm, LA RAFALE Cr. 1, Sta. 27, 11°25′N, 17°21′W, 200 m); USNM 207724 (1: 70.9 mm, LA RAFALE Cr. 1, Sta. 27, 11°25′N, 17°21′W, 200 m); ZMB 23101 (1: 148.9 mm, MORS Sta. 136/72, 18°36′S, 11°29′E, 275 m); ZMB 23102 (1: 116.5 mm, MORS Sta. 175/72, 18°05′S, 11°27′E, 360 m).

Diagnosis

In the past, *E. constanciae* has been mistaken for *E. telescopus* (Risso) and *E. pandionis* (Goode and Bean). The distribution

of *E. constanciae* also makes confusion likely with *E. denticulatus* Dieuzeide. *E. constanciae* may be distinguished from the above species by the presence of VII–I, 9 dorsal fin elements, a pungent opercular spine, lingual teeth and six to eight pyloric caeca.

E. constanciae most closely resembles *E. pectinifer* Mayer, a species found in the Caribbean Sea, the Gulf of Mexico and the western Pacific Ocean. The former is distinguished by the presence of numerous awl-like fill rakers (29–36) and elongate D_2I and AII fin spines (12.7–16.5 per cent and 13.5–16.8 per cent SL, respectively).

Description

See Tables 1 and 2 for morphometric and meristic data.

Body elongate, fusiform in larger individuals; body depth 21.1–30.0 per cent SL. Head moderate, length 32.2–38.9 per cent SL; height 16.2–18.7 per cent SL. Snout tapering to a rounded point, 7.0–9.1 per cent SL. Lower jaw 13.9–17.6 per cent SL; equal to or projecting slightly beyond upper jaw; bearing two nubs of variable prominence on anterior surface of mandible near symphysis. Maxilla reaching 1/3–1/2 length of eye; ventrolateral surface of maxillary head bearing sharp, posteriorly re-

Table 1. *Epigonus constanciae* regression parameters. u = functional (GM) regression coefficient; v = Y intercept of GM regression line, Y = uX + v; b = predictive regression coefficient ±95 per cent confidence interval; a = Y intercept of predictive regression line, Y = bX + a; n = number of specimens.

	u	v	b	a	n
HL	0.391	4.033	0.348 ± 0.026	3.240	33
Head height	0.191	-1.810	0.189 ± 0.011	1.566	30
Body depth	0.332	8.043	0.324 ± 0.027	7.062	33
Eye diameter	0.168	0.976	0.164 ± 0.015	0.367	32
Snout length	0.078	0.333	0.074 ± 0.010	0.922	32
Maxillary length	0.161	0.384	0.157 ± 0.013	0.076	34
Lower jaw length	0.174	1.280	0.167 ± 0.017	0.428	36
Interorbital width	0.090	0.910	0.087 ± 0.008	1.300	36
Caudal peduncle length	0.269	0.333	0.264 ± 0.018	0.242	35
Caudal peduncle depth	0.145	3.418	0.139 ± 0.015	2.673	34
D_2I	0.156	1.219	0.150 ± 0.015	0.546	31
AII	0.156	0.547	0.149 ± 0.019	0.282	27
P_2I	0.145	0.298	0.142 ± 0.009	0.233	35

Table 2. *Epigonus constanciae* meristic data. $\overline{X}$ = mean; SD = standard deviation; n = number of specimens.

	$\overline{X}$	Range	SD	n
Pectoral fin rays	17.65	16–19	0.62	40
Gill rakers				
Total	32.43	29–36	1.75	40
Upper arch	9.18	8–10	0.64	39
Lower arch	22.31	20–25	1.30	39
Lateral line scales	47.74	46–50	0.93	34
Pyloric caeca	7.00	6–8	0.64	35

curved process, may be obscured by overlying skin. Eye longer than high, reaching upper profile of head, 41.1–49.1 per cent HL. Interorbital width 8.7–10.9 per cent SL. Caudal peduncle moderate, length 24.3–28.8 per cent SL; depth 9.7–13.8 per cent SL.

Dentition subject to ontogenetic and geographic variation (see Mayer, 1974: 185 and below). Teeth small, conical; present on premaxillae, mandibles and vomer; palatines edentulous or dentigerous; tongue dentigerous, bearing triangular patch of glossohyal teeth along midline and broad, closely-spaced patches of teeth parallel to margins; endo- and ectopterygoids edentulous.

Opercle dominated by pungent, bony spine; surmounted by one or more poorly ossified spinelets. Preopercle well-ossified; angle narrowly produced; ornamentation subject to geographic variation (see below). Interopercle and subopercle weakly serrated or unserrated.

Gill rakers awl-like, 29–36 on first gill arch, 8–10 on upper portion, 20–25 on lower portion (see Table 2).

First dorsal fin VII (38); second dorsal fin I, 8 (2), I, 9 (36), I, 10 (1). Anal fin I, 8 (1), II, 9 (36); ventral fins I, 5 (40), soft rays extending to level of anus. Pectoral fin 16–19 (see Table 2). D-I variable, 1.7–3.2 per cent SL; D$_2$-I, AII, and P-I long and pungent: 12.7–16.5 per cent, 13.5–16.8 per cent and 13.0–15.5 per cent SL, respectively.

Preserved specimens yellow-brown; mouth light; branchial and peritoneal membranes black; dorsal fin membranes dark. Viscera often sheathed by heavy, yellow-brown fat deposits.

Description based on forty specimens 70.9–158.9 mm SL.

Notes on the Holotype of E. constanciae

As mentioned earlier, Giglioli's description of *Pomatomichthys constanciae* is incomplete and includes a number of inaccuracies. Tortonese and Queirolo (1970) figured and redescribed the holotype but did not fully characterize the fish. One aspect of the present investigation involved reexamining Giglioli's type specimen, now in rather poor condition. Measurements and counts obtained from the holotype appear in the Appendix. Qualitative features not mentioned in previous descriptions include:

1. Lower jaw slightly prominent with two nubs at symphysis.
2. Small teeth on premaxillae, mandibles, vomer, palatines and tongue; lingual dentition composed of a central tooth patch and a series of elongate tooth patches parallel to the borders of the tongue.
3. Opercular spine well-developed; two poorly developed spinelets above, but well-separated from the spine.
4. D_1I and AI spines short; D_2I, AII and P_2I spines long. Longest ventral fin rays reach anus.

If previous *E. trewavasae* descriptions (e.g., Mayer, 1974; Poll, 1954) are compared with *P. constanciae* data presented in the Appendix and above, it becomes apparent that the two forms are synonymous. Giglioli's holotype bears all characters diagnostic of *E. trewavasae* including VII–I, 9 dorsal fin elements, long fin spines, 18 pectoral rays, numerous awl-like gill rakers, a pungent, bony opercular spine, mandibular chin nubs and lingual teeth. The species is correctly called *E. constanciae* because *Pomatomichthys* is a junior synonym of *Epigonus*, and *constanciae* has precedence over *trewavasae*.

The fish was named after Giglioli's wife, Costanza.

DISTRIBUTION

E. constanciae is found from the coast of equatorial west Arfica to the Straits of Messina. The species has also been taken off Madeira and probably occurs off the Canaries and Azores. *E. constanciae* appears most abundant on upper portions of the continental slope between 200 and 400 m.

GEOGRAPHIC VARIATION

Mayer (1974: 185–186) briefly commented on geographic variation in *Epigonus trewavasae* and suggested that Mediterranean and African populations may represent subspecies. At the time, sufficient material was not available to draw firm conclusions about the validity of infraspecific categories. Nevertheless, variations were noted in qualitative characters such as the prominence of chin nubs, the development of vomerine and palatine teeth and the occurrence of preopercular armor.

The consolidation of *Pomatomichthys constanciae* and *Epigonus trewavasae* brings the question of geographic variation into sharper focus, because holotypes of the nominal species were taken from opposite ends of the *E. constanciae* range. An analysis of geographic variation in *E. constanciae* was accomplished by dividing the specimens examined for this study into three geographic groups: a Mediterranean series, a Madeiran series and an African series. The African series was the largest group and included fishes taken along the west African coast from 18°S to 21°N. The lumping of west-central African and northwest African populations follows Maurin's conclusion (1968: 78) that the Cape Blanc-Arguin Bank region represents a major northern faunal limit for demersal forms with tropical affinities.

Table 3. Comparisons of meristic data from African, Mediterranean and Madeiran populations of *Epigonus constanciae*. Afr. = African population; Med. = Mediterranean population; Mad. = Madeiran population. See text for explanation.

	COEFFICIENTS OF DIFFERENCE		
	Afr. vs. Med.	Afr. vs. Mad.	Med. vs. Mad.
Pectoral fin rays	0.33	0.48	0.20
Gill rakers			
Total	0.63	1.24	0.26
Upper arch	0.28	0.59	0.14
Lower arch	0.57	1.27	0.39
Lateral line scales	0.50	0.61	0.16
Pyloric caeca	0.12	0.38	0.09

Meristic Characters

Meristic data comparisons were accomplished by calculating Coefficients of Difference (C.D.'s) (Mayr, 1969: 189–193) for the three geographic groups. The index indicates the degree of non-overlap between two populations for a given character. Populations exhibiting a non-overlap of 90 per cent or more (C.D.$\geqslant$1.28) are considered distinct at the subspecies level. Table 3 presents data from the current study. As indicated, none of the differences observed are significant at the subspecies level.

Morphometric Characters

Analogous examinations of mensural data were undertaken using regression techniques. Individual values obtained from Mediterranean and Madeiran specimens were compared to regression data from African populations by means of Student's t-tests. Results of the tests are summarized below.

Mediterranean and African populations are very similar and do not appear distinct at the subspecies level. Only one Mediterranean data point fell outside the 99 per cent confidence limits of the African group and most data points fell within the 95 per cent or 98 per cent limits.

The Madeiran population is more distinct. Madeiran *E. constanciae* appear characterized by shallower bodies, shorter heads and shorter jaws than African forms. However, part of the divergence may be an artifact of the Madeiran specimens' poor condition. All were obtained from the stomachs of large, predatory fishes and many were considerably damaged. Additional data are required to assess the taxonomic significance of differences exhibited by the Madeiran specimens.

Qualitative Characters

Geographic variability reported by Mayer (1974) for qualitative characters was confirmed by the present study. Character states such as prominent chin nubs, weakly armored preopercular margins, edentulous palatines and vomerine tooth patches lacking posterior median extensions are prevalent, but not uniform among fishes from equatorial west Africa. In contrast, poorly

developed chin nubs, spinous preopercular margins, dentigerous palatines and vomerine tooth patches with posterior median extensions are common among Mediterranean specimens. The frequency of "northern" and "southern" character states varies with latitude. Madeiran and Mauritanian specimens tend to be intermediate, with the former more closely resembling Mediterranean fish and the latter more similar to specimens from equatorial Africa. Because characters exhibit continuous variation along the range of the species, and because populations at species' distribution limits exhibit a mixture of character states and are not uniformly "northern" or "southern", qualitative characters do not support the division of *E. constanciae* into formal subspecies.

CONCLUSIONS

The picture that emerges for *Epigonus constanciae* is one of a polymorphic species whose range extends from the eastern equatorial Atlantic to the western Mediterranean. This pattern has been reported for other organisms by many authors (e.g., Briggs, 1974; Maurin, 1968; Tortonese, 1964, 1960; Ekman, 1953). The prevalence of polymorphism among Atlantic and Mediterranean populations has been discussed by Tortonese (1964: 103–104; 1959 387). Although genetic differences between populations cannot be ruled out, Tortonese suggests that Atlantic-Mediterranean phenotypic dissimilarities may be induced by regional differences in temperature regime and food availability.

It has been suggested elsewhere (Mayer, 1972) that *E. constanciae* may be among the least vagile species of the genus *Epigonus*. Adults appear strongly associated with the substrate. Neither pelagic larvae nor pelagic juveniles are known for this species, although such forms have been discovered for several congeners. The smallest known specimen of *E. constanciae* is a 29.8 mm SL juvenile (IRSN 16548) taken by a bottom trawl off Sardinia. The latter data suggest that *E. constanciae* may have either a short-lived pelagic phase or may lack a pelagic phase entirely.

The hypothesis of limited vagility fits the pattern of phenotypic variability observed for *E. constanciae*. Individual populations adapt to local conditions and evolve characteristic traits. Breeding may be assumed to occur primarily between members of the same or

neighboring populations, thus preserving local phenotypes. Relatively isolated populations, such as that from Madeira, are more unique in appearance but still conform to phenotypic patterns resulting from latitudinal gradients in environmental or genetic factors.

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BIBLIOGRAPHY

Briggs, J. C. 1974. Marine Zoogeography. New York: McGraw-Hill Book Co. 475 pp.

Cavaliere, A. 1956. Su rari stadi larvali e giovanili di *Pomatomichthys constanciae* Gigl. e relativa differenziazione da stadi giovanili della specie affine *Pomatomus telescopium* Risso. Boll. Pesca Piscicult. Idrobiol., (n.s.) *11*(1): 121–127.

Ekman, S. 1953. *Zoogeography of the Sea*. London: Sidgwick and Jackson, Ltd. 417 pp.

Giglioli, E. H. 1880. Elenco dei Mammiferi, degli Uccelli e dei Rettili Ittiofagi Appartenenti alla Fauna Italica e Catalogo degli Anfibi e dei Pesci Italiani. Firenze: Stamperia Reale. 85 pp.

Goode, G. B., and T. H. Bean. 1896. Oceanic Ichthyology. Washington, D.C.: Smithsonian Institution. 553 pp.

Hubbs, C. L., and K. F. Lagler. 1958. Fishes of the Great Lakes Region. Ann Arbor: Univ. Mich. Press. 213 pp.

Jordan, D. S., and B. W. Evermann. 1896. The fishes of North and Middle America. Bull. U.S. Nat. Mus., *47*(1): 1–1240.

———, ———, and H. W. Clark. 1930. Check List of the Fishes of North and Middle America. Appendix X, Report to the United States Commissioner of Fisheries for 1928. Washington, D.C.: U.S. Government Printing Office. 670 pp.

Maurin, C. 1968. Écologie ichthyologiques des fonds Chalutables atlantiques (de la baie ibéro-marocaine à la Mauritanie) et de la Mediterranée occidentale. Thèses presentées à la Faculté des Sciences de l'Université de Nancy. No. d'Ordre: A. O. 2 182. 145 pp.

Mayer, G. F. 1972. Systematics, functional anatomy, and ecology of the cardinalfish genus *Epigonus* (Apogonidae). Ph.D. Thesis. Harvard University. 190 pp.

———. 1974. A revision of the cardinalfish genus *Epigonus* (Perciformes, Apogonidae), with descriptions of two new species. Bull. Mus. Comp. Zool., *146*(3): 147–203.

———. 1975. Results of the research cruises of FRV "Walther Herwig" to South America. XXXIX. The epigonine fauna of the South Atlantic, with a key to the genera and a redescription of *Rosenblattia robusta* Mead and De Falla. Arch. Fisch. Wiss., *26*(1): 13–28.

Mayr, E. 1969. Principles of Systematic Zoology. New York: McGraw-Hill, Inc. 428 pp.

Poll, M. 1954. Poissons. IV. Teleostéens acanthoptérygiens (première partie). Rés. Sci. Expéd. Océanogr. Belge Eaux Côt. Afr. Atl. Sud, *4*(3A): 1–390.

Ricker, W. E. 1973. Linear regressions in fishery research. J. Fish. Res. Bd. Canada, *30*: 409–434.

Schultz, L. P. 1940. Two new genera and three new species of cheilodipterid fishes, with notes on other genera of the family. Proc. U.S. Nat. Mus., *88*(3085): 403–423.

Tortonese, E. 1959. General remarks on the Mediterranean deep-sea fishes. In: International Oceanographic Conference, 1959, Preprints, M. Sears (ed.). Washington, D.C.: Amer. Assoc. Adv. Sci. 386–387.

———. 1964. The main biogeographical features and problems of the Mediterranean fish fauna. Copeia, *1964*(1): 98–107.

———. 1973. Apogonidae. In: Check-list of the Fishes of the Northeastern Atlantic and of the Mediterranean. Vol. 1, J. C. Hureau and Th. Monod (eds.). Paris: UNESCO. 365–367.

———, and L. C. Queirolo. 1970. Contributo allo studio dell' ittiofauna del Mar Ligure orientale. Ann. Mus. St. Nat. Genova, *78*: 21–46.

APPENDIX

Meristic and morphometric data obtained from the holotype of *Epigonus constanciae*, MZF 3089. Measurements are in millimeters.

Meristic data

Dorsal fin	VII I, 9	Pelvic fin	I,5
Anal fin	II, 9	Lateral line	46
Pectoral fin	18	Gill rakers	30

Morphometric data

SL	115	Interorbital width	12.5
HL	37	Maxilla	16
Head height	19.5	Caudal peduncle length	29
Body depth	30	Caudal peduncle depth	13
Eye	17	D_2I	16
Snout	8	AII	17
		P_2I	15